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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

Christopher D. Eckhoff

Application No: 09/977,875

Filed: October 15, 2001

For: SUBSCRIBER LINE INTERFACE CIRCUITRY WITH MODIFIED DC FEED

Examiner: Jamal, Alexander

Art Unit: 2614

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Appeal Brief Under 37 C.F.R. § 41.37

Appellant respectfully submits this appeal brief in response to the Final Office Action dated October 18, 2006. The Notice of Appeal was timely filed March 19, 2007 with the appropriate extension of time petition and fee and was received on March 23, 2007 thus setting a two month period ending May 23, 2007 for the Appeal Brief.

This Appeal Brief is accompanied by a four month extension of time extending the time period for response from May 23, 2007 to September 23, 2007 or the next business day that is not a Saturday, Sunday, or federal holiday. Given that September 23, 2007 falls on a Sunday, appellant submits that this Appeal Brief is timely filed when mailed on or before SEPTEMBER 24, 2007 as indicated by the certificate of mailing above.

Appellant respectfully requests consideration of this Appeal by the Board of Patent Appeals and Interferences for allowance of the above-referenced application.

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I. REAL PARTY IN INTEREST

The above-identified application for patent is assigned to Silicon Laboratories, Inc., the real party in interest. Silicon Laboratories, Inc. is a Delaware corporation having a principal place of business at 400 W. Cesar Chavez, Austin, Texas 78701.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any other related appeals or interferences that may directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF THE CLAIMS

Claims 1-16 are pending.

Claims 1, 2, 3-5,13, 14, and 16 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,619,567 of Apfel ("Apfel") and U.S. Patent No. 6,665,398 of Ludeman ("Ludeman").

Claims 6-9, 10-12, and 15 were rejected under 35 U.S.C. § 103 as being unpatentable over Apfel, Ludeman, and U.S. Patent No. 5,878,133 of Zhou ("Zhou").

IV. STATUS OF AMENDMENTS

The Claims Appendix of this Appeal Brief reflects the claims and amendment status. An Amendment After Final accompanies this Appeal Brief, but no other amendments have been submitted in response to the Final Office Action dated October 18, 2006. Appellant has identified the status of claim 13 in the Appendix with "UPON ENTRY OF AMENDMENT AFTER FINAL" to draw attention to the fact that the claim language for purposes of appeal is determined by whether the accompanying amendment after final is entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A. Overview

A subscriber line connects subscriber equipment such as a telephone to a central office. A subscriber line interface circuit (SLIC) provides the interface between the subscriber line and the public switched telephone network. The SLIC is responsible for controlling the subscriber line DC feed. In the present case, the SLIC controls the subscriber line DC feed to follow one of two characteristic curves. The SLIC switches between the two curves with a hysteresis.

B. Summary of Claim 1

Claim 1 is directed to a method for controlling a subscriber line interface circuit DC feed. The DC feed includes a metallic voltage (V_M) and a loop current. The method includes a) switching from a normal mode DC feed to a modified mode DC feed when V_M is less than or equal to a first threshold voltage ($V_{THRESH1}$). In particular, when $V_M \le V_{THRESH1}$ the DC feed is transitioned from a first point (332) on a first characteristic curve (330) associated with the normal mode to a first point (344) on a second characteristic curve (340) associated with the modified mode. (see also blocks 430, 440 in Figure 4)

The method includes b) switching from the modified mode to the normal mode when V_M is greater than or equal to a second threshold voltage ($V_{THRESH2}$). In particular, when $V_M \ge V_{THRESH2}$, the DC feed is transitioned from a second point (342) on the second characteristic curve (340) to a second point (334) on the first characteristic curve (330). (see also blocks 450, 420 of Figure 4). The first and second points (332, 334, 342, 344) of each of the first and second characteristic curves are all distinct. In addition, the first point (332) of the first characteristic curve and the second point (342) of the second characteristic curve have distinct loop currents. (Specification, p. 8, line 12 – p. 9, line 15; p. 10, lines 3-18; Figs. 3, 4).

C. Summary of Claim 6

Claim 6 is directed to an apparatus including control circuitry for controlling a subscriber loop DC feed with hysteresis relative to first and second thresholds ($V_{THRESH1}$ 350, $V_{THRESH2}$ 360). The DC feed includes a metallic voltage (V_M) and a loop current. A plurality of programmable registers (552, 554, 556, 558) store values defining a first characteristic curve (330) and a second characteristic curve (340).

The control circuitry (see Fig. 5) switches from a normal mode DC feed following the first characteristic curve (330) to a modified mode DC feed following the second characteristic curve (340) when $V_M \le V_{THRESH1}$. The control circuitry switches the DC feed from the modified mode to the normal mode when $V_M \ge V_{THRESH2}$. The switching from the normal mode and the switching from the modified mode occur at distinct loop currents. In addition, $V_{THRESH1} < V_{THRESH2}$. (Specification, p. 8, line 12 – p. 9, line 15; p. 10, lines 3-18; Figs. 3, 4, 5)

D. Summary of Claim 13

Claim 13 is directed to a method for controlling a subscriber line interface circuit DC feed. The method includes switching from a normal mode DC feed following a first characteristic curve (330) to a modified mode DC feed following a second characteristic curve (340) when the subscriber loop current (I_L) is greater than or equal to a first current threshold (I_{THL} 392), i.e., when $I_L \ge I_{THL}$.

The method includes switching from the modified mode to the normal mode when the loop current is less than or equal to a second current threshold (I_{THH} 394) (i.e., $I_L \le I_{THH}$). The first and second current thresholds are distinct. Switching between modes occurs with hysteresis such that for each characteristic curve, the switched-to DC feed point is substantially distinct from the switched-from DC feed point on the same characteristic curve. (Specification, p. 9, line 16 – p. 10, line 18; Figs. 3, 5).

VI. GROUNDS OF REJECTION TO BE REVIEWED UPON APPEAL

The rejection of claims 1-16 under 35 U.S.C. § 103 over various combinations of Apfel, Ludeman, and Zhou.

VII. ARGUMENT

A. Rejection of claims 1, 6, and 13 under 35 U.S.C. § 103

1. *Statement of Law*

In order to sustain a rejection under 35 U.S.C. § 103, three criteria must be met:

> *First,* there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *Second,* there must be a reasonable expectation of success. *Finally,* the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure

(*In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991)(*emphasis added*)

Appellant respectfully submits that the Examiner has not established a *prima facie* case of obviousness under 35 U.S.C. § 103.

2. *References when combined do not teach all claim limitations*

a. **References do not teach or suggest switching between modes based upon voltage thresholds (claims 1-12)**

The Examiner has stated in part:

> As per claim 1, Apfel discloses a variable DC feed characteristic for a SLIC that switches from a normal mode 401 to a modified mode 402 DC feed (Fig. 4). The normal mode is switched to the modified mode when Vab is less than or equal to threshold B. The mode is switched back to the normal mode at threshold E. Apfel discloses that mode is switched (from either on-hook to off-hook or off-hook to on-hook) based upon a hook switch threshold (points E and B in fig. 4). However, Apfel does not disclose that the switching occurs at two distinct loop currents (Apfel only has one switching threshold).

(10/16/2006 Final Office Action, pp. 2-3)

Appellant traverses the Examiner's statement at least in part. Apfel discloses the use of hysteresis for DC feed control, however, Apfel relies on a *single loop current threshold* rather than one or more voltage thresholds to determine when to switch between modes. The Examiner is referred to Apfel's Figures 3 and 5. Note that switch 315 (531) is used to couple/decouple current source I3 from contributing to the I_{SUM} from which the loop current is derived. Switch 315 (531) is controlled by a hook switch detector (313/533) which indicates on hook/off-hook status by measuring the loop current, I_L.

Accordingly, *Apfel does not teach or suggest a) switching from a normal mode DC feed to a modified mode DC feed when $V_M \leq V_{THRESH1}$, wherein V_M is a subscriber loop metallic voltage; and b) switching from the modified mode to the normal mode when $V_M \geq V_{THRESH2}$.*

Ludeman is cited for the proposition of teaching the use of two switching thresholds Ish- and Ish+ for switching between onhook and offhook. The Examiner has improperly attempted to combine Ludeman with Apfel in this circumstance as argued below.

Appellant respectfully submits, that Ludeman does not teach or suggest the use of hysteresis. There is only one characteristic curve. Alternatively, one might view Ludeman as disclosing multiple characteristic curves, but there is no hysteresis. For example, when switching between curves there is only one transition point. The same path for transitioning between characteristic curves is followed regardless of which characteristic curve is being switched to. Ludeman's "transition-to" and "transition-from" point is one and the same. One follows the same path regardless of the direction of travel along the curve(s) illustrated in Figure 6. (Ludeman, Fig. 6).

Ludeman still does not teach or suggest switching based upon voltage thresholds. In particular, *Ludeman does not teach or suggest a) switching from a normal mode DC feed to a modified mode DC feed when $V_M \leq V_{THRESH1}$, wherein V_M is a subscriber loop metallic voltage; and b) switching from the modified mode to the normal mode when $V_M \geq V_{THRESH2}$.*

Zhou is cited only for the teaching of the use of registers to define characteristic curves. Points of the "power control curve" of Figure 2 may be defined by values stored in registers, however, the "power control curve" does not exhibit any hysteresis. The path traveling in one direction along the curve is identical to the path traveling the other direction along the curve. *Zhou does not teach or disclose hysteresis or switching between characteristic curves based upon voltage thresholds as claimed.*

In contrast, claim 1 includes the language:

> 1. *A method of controlling a subscriber loop interface circuit (SLIC) DC feed with hysteresis*, comprising:
>
> *a) switching from a normal mode DC feed to a modified mode DC feed when $V_M \leq V_{THRESH1}$, wherein a DC feed defined by metallic voltage (V_M)* and loop current is transitioned from a first point on a first characteristic curve associated with the normal mode to a first point on a second characteristic curve associated with the modified mode; and
>
> *b) switching from the modified mode to the normal mode when* $V_M \geq V_{THRESH2}$, wherein the DC feed is transitioned from a second point on the second characteristic curve to a second point on the first characteristic curve, wherein the first and second points of each of the first and second characteristic curves are all distinct, wherein the first point of the first characteristic curve and the second point of the second characteristic curve have distinct loop currents.

(Claim 1)(*emphasis added*)

Similar arguments can be presented with respect to claim 6. In particular, the cited references alone or in combination do not teach or suggest

In contrast, claim 6 includes the language:

> 6. A subscriber loop interface circuit apparatus comprising:
>
> *control circuitry for controlling a subscriber loop DC feed with hysteresis;* and
>
> a plurality of programmable registers storing values defining a first characteristic curve and a second characteristic curve, *wherein the control circuitry switches from a normal mode DC feed following the first characteristic curve to a modified mode DC feed following the second characteristic curve when $V_M \leq V_{THRESH1}$, wherein V_M is a metallic voltage, wherein the control circuitry switches from the modified mode to the normal mode when $V_M \geq V_{THRESH2}$, wherein $V_{THRESH1} < V_{THRESH2}$,* wherein the switching from the normal mode and the switching from the modified mode occur at distinct loop currents.

(Claim 6)(*emphasis added*)

b. **References do not teach or suggest switching from the normal mode and switching from the modified mode at distinct loop currents (claims 1-16)**

None of the cited references alone or combined teaches or suggests two thresholds for switching between normal mode and modified mode characteristic curves, *wherein the switching from the normal mode and the switching from the modified mode occur at distinct loop currents*.

Apfel discloses the use of hysteresis for DC feed control, however, Apfel relies on a *single loop current threshold* rather than one or more voltage thresholds to determine when to switch between modes. The Examiner is referred to Apfel's Figures 3 and 5. Note that switch 315 (531) is used to couple/decouple current source I3 from contributing to the I_{SUM} from which the loop current is derived. Switch 315 (531) is controlled by a hook switch detector (313/533) which indicates on hook/off-hook status by measuring the loop current, I_L. *Note that there is no distinction in the loop current between Apfel's points "B" and "E".* (Apfel, col. 4, lines 7-39; col. 5, lines 35-50; col. 6, lines 38-49; Figs. 3, 4, 5).

Thus appellant respectfully submits that although Apfel discloses DC feed with hysteresis, Apfel does not teach or disclose *a method of controlling a SLIC DC feed with hysteresis* including a) transitioning DC feed from a first point on a first characteristic curve to a first point on a second characteristic curve, and b) transitioning DC feed from a second point on the second characteristic curve to a second point on the first characteristic curve, *wherein the points are all distinct AND the first point of the first characteristic curve and the second point of the second characteristic curve have distinct loop currents. Clearly, Apfel teaches away from switching at distinct loop currents.*

Zhou is cited only for the teaching of the use of registers to define characteristic curves. Points of the "power control curve" of Figure 2 may be defined by values stored in registers, however, the "power control curve" does not exhibit any hysteresis. The path traveling in one direction along the curve is identical to the path traveling the other direction along the curve. Zhou does not teach or disclose hysteresis or switching between characteristic curves, *wherein*

the switching from the normal mode and the switching from the modified mode occur at distinct loop currents. (Zhou, col. 5, line 52 – col. 7, line 49; Fig. 2)

Ludeman is cited for the proposition of teaching the use of two switching thresholds Ish- and Ish+ for switching between onhook and offhook. The Examiner has improperly attempted to combine Ludeman with Apfel in this circumstance as argued below.

Appellant respectfully submits, that Ludeman does not teach or suggest the use of hysteresis. There is only one characteristic curve. Alternatively, one might view Ludeman as disclosing multiple characteristic curves, but there is no hysteresis. For example, when switching between curves there is only one transition point. The same path for transitioning between characteristic curves is followed regardless of which characteristic curve is being switched to. Ludeman's "transition-to" and "transition-from" point is one and the same. One follows the same path regardless of the direction of travel along the curve(s) illustrated in Figure 6. (see, Ludeman, Fig. 6).

Thus none of the cited references, alone or in combination, teaches or discloses *a method of controlling a SLIC DC feed with hysteresis* including a) transitioning DC feed from a first point on a first characteristic curve to a first point on a second characteristic curve, and b) transitioning DC feed from a second point on the second characteristic curve to a second point on the first characteristic curve, *wherein the points are all distinct AND the first point of the first characteristic curve and the second point of the second characteristic curve have distinct loop currents.*

In contrast, claim 1 includes the language:

1. A method of controlling a subscriber loop interface circuit (SLIC) DC feed with hysteresis, comprising:

a) switching from a normal mode DC feed to a modified mode DC feed when $V_M \leq V_{THRESH1}$, *wherein a DC feed defined by metallic voltage (V_M) and loop current is transitioned from a first point on a first characteristic curve associated with the normal mode to a first point on a second characteristic curve associated with the modified mode*; and

b) switching from the modified mode to the normal mode when $V_M \geq V_{THRESH2}$, *wherein the DC feed is transitioned from a second point on the*

second characteristic curve to a second point on the first characteristic curve, wherein the first and second points of each of the first and second characteristic curves are all distinct, wherein the first point of the first characteristic curve and the second point of the second characteristic curve have distinct loop currents.

(Claim 1)(*emphasis added*)

Similar arguments can be presented with respect to claim 6. In particular, the cited references alone or in combination do not teach or suggest *a) switching from a normal mode DC feed following the first characteristic curve to a modified mode DC feed following the second characteristic curve when* $V_M \leq V_{THRESH1}$, *and b) switching from the modified mode to the normal mode when* $V_M \geq V_{THRESH2}$, *wherein* $V_{THRESH1} < V_{THRESH2}$, *wherein the switching from the normal mode and the switching from the modified mode occur at distinct loop current*

In contrast, claim 6 includes the language:

6. A subscriber loop interface circuit apparatus comprising:
control circuitry for controlling a subscriber loop DC feed with hysteresis; and
a plurality of programmable registers storing values defining a first characteristic curve and a second characteristic curve, *wherein the control circuitry switches from a normal mode DC feed following the first characteristic curve to a modified mode DC feed following the second characteristic curve when* $V_M \leq V_{THRESH1}$, *wherein* V_M *is a metallic voltage, wherein the control circuitry switches from the modified mode to the normal mode when* $V_M \geq V_{THRESH2}$, *wherein* $V_{THRESH1} < V_{THRESH2}$, *wherein the switching from the normal mode and the switching from the modified mode occur at distinct loop currents.*

(Claim 6)(*emphasis added*)

Likewise, similar arguments may be made with respect to claim 13. The cited references do not teach or suggest switching between modes with hysteresis and at distinct loop currents. In contrast, claim 13 includes the language:

13. A method of controlling a DC feed from a subscriber loop interface circuit (SLIC), comprising the steps of:
switching from a normal mode DC feed following a first characteristic curve to a modified mode DC feed following a second characteristic curve when $I_L \geq I_{THL}$, *wherein* I_L *is a subscriber loop current;* and
switching from the modified mode to the normal mode when $I_L \leq I_{THH}$, *wherein* $I_{THH} \geq I_{THL}$, *wherein switching between modes occurs with hysteresis such that for each characteristic curve the switched-to DC feed point is*

substantially distinct from the switched-from DC feed point on the same characteristic curve.

(Claim 13)(*emphasis added*)

Appellant thus submits that the cited references alone or combined do not teach or suggest all the claim limitations of claims 1, 6, and 13.

3. *No suggestion to combine references*

The Examiner appears to be arguing that Apfel should be modified in view of Ludeman in order to achieve distinct loop currents for switching. Appellant submits, however, that only Apfel discloses hysteresis and the references may not be so readily combined to achieve the result proposed by the Examiner.

Appellant submits that such a modification would suggest the adoption of the curve of Ludeman or some variation of it (i.e., elimination of the hysteresis set forth in Apfel) rather than the modification proposed by the Examiner *which is not taught or suggested by either reference alone or in combination*. Appellant submits, however, that no suggestion is found in either reference for combination. To the contrary, the references appear to teach away from each other based upon the clear differences in the DC feed characteristic curves.

4. *Combination is unworkable*

Appellant submits that there is no "combination" that renders the combination workable consistent with the teachings of either reference. For example, how would the Examiner propose modifying the circuitry of Apfel based upon Ludeman and exactly how would the modification allegedly taught by Ludeman affect the hysteresis curve of Apfel? Recall, Ludeman does not teach or disclose any such hysteresis. There is no teaching or suggestion in Ludeman that the subject matter of Ludeman would be applicable or useful in the Apfel environment where hysteresis is used for better control of the DC feed.

Apfel is drawn to decreasing the loss of overhead voltage in the off-hook condition. Ludeman's approach, however, fosters the loss of overhead voltage (see, e.g., Ludeman, Fig. 6). Also of note, both references teach modifying the prior art with respect to changing the DC feed curve in the invalid region of operation.

B. Claims 1, 6, 13 patentable under 35 U.S.C § 103

In view of the arguments presented above, appellant respectfully submits claims 1, 6, and 13 are patentable under 35 U.S.C. § 103.

C. Claims 2-5, 7-12, and 14-16 are patentable by dependency

Based on the arguments presented above, appellant submits that claims 1, 6, and 13 are patentable under 35 U.S.C. § 103 in view of the cited references. Given that claims 2-5 depend from claim 1, claims 7-12 depend from claim 6, and claims 14-16 depend from claim 13, appellant submits claims 2-5, 7-12, and 14-16 are likewise patentable under 35 U.S.C. § 103 in view of the cited references.

VIII. COMMENT ON OTHER REFERENCES

The Examiner cited U.S. Patent No. 6,157,716 of Ortel ("Ortel") in the Final Office Action as a reference of interest, but made no arguments with respect to Ortel. Appellant nonetheless is compelled to address Ortel because of the Examiner's references in the Final Office Action.

The Examiner alleged that Ortel teaches hysteresis in the context of subscriber loop DC feed. Appellant requests the Examiner to inspect Figure 16 of Ortel and note that the characteristic curves have a zero slope (i.e., zero impedance) such that the voltages are constant. In addition, the DC feed curve is horizontally "flipped" from that of appellant's Figure 3 as well as Apfel's Fig. 4.

Appellant agrees with the Examiner's generalization that Ortel discloses hysteresis. However, appellant notes that given the constant voltages (Ortel, Fig. 16, see V1, V2), Ortel clearly does not perform any switching based upon

voltage thresholds because the voltage does not change along either characteristic curve. Accordingly, Ortel does not affect the patentability of claims 1-12.

With respect to claims 13-16, appellant has requested entry of an Amendment After Final. Appellant notes that the amendment further narrows the previous limitation of I_{THL} and I_{THH} being distinct by requiring $I_{THH}>I_{THL}$. *Such a limitation inherently preserves the previous limitation of distinctness while imposing an additional constraint on the relationship between I_{THH} and I_{THL}.* There is no analogy of appellant's claimed "first" and "second" characteristic curves to Ortel's Figure 16 that would result in consistency with the remainder of appellant's claim language.

Applying the language of claim 13 to Ortel's Figure 16, let the first and second characteristic curves be assigned V_M=V2 and V_M=V1, respectively. Then the switching from the first to the second occurs at $I_{THL}=I2+\Delta I$. The switching from the second to the first occurs at $I_{THH}=I2-\Delta I$. However, $I2+\Delta I>I2-\Delta I$ so with this assignment Ortel does not meet appellant's claim limitation of $I_{THH}>I_{THL}$.

Let the first and second characteristic curves be assigned V_M=V1 and V_M=V2, respectively. Then the switching from the first to the second occurs as $I_{THL}=I2-\Delta I$. The switching from the second to the first occurs as $I_{THH}=I2+\Delta I$. Although the condition $I_{THH}>I_{THL}$ is met, the switching from the first to the second curve occurs when $I_L \leq I_{THL}$ (as I_L is decreasing) instead of when $I_L \geq I_{THL}$ (i.e., when I_L is increasing) as claimed. Similarly the switching from the second to the first occurs as $I_L \geq I_{THH}$ (i.e., as I_L is increasing) instead of when $I_L \leq I_{THH}$ (i.e., as I_L is decreasing) as claimed. Thus with this assignment, the switching is not occurring in accordance with the threshold conditions as claimed.

Appellant thus submits that the amendment further narrows the existing limitations and ensures that claim 13 is patentable over Ortel. Claims 14-16 are likewise patentable given their dependence from claim 13.

IX. CONCLUSION

Appellant respectfully submits that the stated rejections cannot be maintained in view of the arguments set forth above. Appellant respectfully requests that the Board of Patent Appeals and Interferences direct allowance of the pending claims 1-16.

If there are any issues that can be resolved by telephone conference, the undersigned representative of the appellant may be contacted at **(512) 858-9910.**

Respectfully submitted,

September 24, 2007
Date

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CLAIMS APPENDIX

1. (PREVIOUSLY PRESENTED) A method of controlling a subscriber loop interface circuit (SLIC) DC feed with hysteresis, comprising:

a) switching from a normal mode DC feed to a modified mode DC feed when $V_M \leq V_{THRESH1}$, wherein a DC feed defined by metallic voltage (V_M) and loop current is transitioned from a first point on a first characteristic curve associated with the normal mode to a first point on a second characteristic curve associated with the modified mode; and

b) switching from the modified mode to the normal mode when $V_M \geq V_{THRESH2}$, wherein the DC feed is transitioned from a second point on the second characteristic curve to a second point on the first characteristic curve, wherein the first and second points of each of the first and second characteristic curves are all distinct, wherein the first point of the first characteristic curve and the second point of the second characteristic curve have distinct loop currents.

2. (ORIGINAL) The method of claim 1 wherein the first characteristic curve is linear, wherein the first characteristic curve is defined by an open circuit voltage, V_{OC}, and a slope corresponding to a pre-determined impedance.

3. (ORIGINAL) The method of claim 1 wherein the first characteristic curve is linear, wherein the second characteristic curve is defined by a target open circuit voltage, V_{OC_TARGET}, and a slope corresponding to a pre-determined impedance.

4. (ORIGINAL) The method of claim 1 wherein the first and second characteristic curves are linear, wherein the first characteristic curve is defined by an open circuit voltage, V_{OC}, and a pre-determined slope, wherein the second characteristic curve is defined by a target open circuit voltage, V_{OC_TARGET}, and the same pre-determined slope corresponding to a pre-determined impedance.

5. (ORIGINAL) The method of claim 4 wherein the pre-determined impedance is approximately 320Ω.

6. (PREVIOUSLY PRESENTED) A subscriber loop interface circuit apparatus comprising:

control circuitry for controlling a subscriber loop DC feed with hysteresis; and

a plurality of programmable registers storing values defining a first characteristic curve and a second characteristic curve, wherein the control circuitry switches from a normal mode DC feed following the first characteristic curve to a modified mode DC feed following the second characteristic curve when $V_M \leq V_{THRESH1}$, wherein V_M is a metallic voltage, wherein the control circuitry switches from the modified mode to the normal mode when $V_M \geq V_{THRESH2}$, wherein $V_{THRESH1} < V_{THRESH2}$, wherein the switching from the normal mode and the switching from the modified mode occur at distinct loop currents.

7. (ORIGINAL) The apparatus of claim 6 further comprising a digital signal processor.

8. (ORIGINAL) The apparatus of claim 6, wherein one of the plurality of programmable registers stores an open circuit voltage value, wherein the open circuit voltage value in conjunction with a pre-determined slope defines a linear first characteristic curve.

9. (PREVIOUSLY PRESENTED) The apparatus of claim 6, wherein one of the plurality of programmable registers stores a value enabling computation of a target open circuit voltage value, wherein the target open circuit voltage value in conjunction with a pre-determined slope defines a linear second characteristic curve.

10. (PREVIOUSLY PRESENTED) The apparatus of claim 9 wherein the plurality of registers stores an open circuit voltage value (V_{OC}), a first relative threshold (V_{THL}), a second relative threshold (V_{THH}), and a relative target open circuit voltage (V_{OC_DELTA}), wherein $V_{THRESH1}=V_{OC}+V_{THL}$, $V_{THRESH2}=V_{OC}+V_{THH}$, and the target open circuit voltage = $V_{OC}+V_{OC\_DELTA}$.

11. (ORIGINAL) The apparatus of claim 6 wherein the first and second characteristic curves are linear, wherein the first characteristic curve is defined by an open circuit voltage, V_{OC}, and a pre-determined slope, wherein the second characteristic curve is defined by a target open circuit voltage, V_{OC_TARGET}, and the same pre-determined slope corresponding to a pre-determined impedance.

12. (ORIGINAL) The apparatus of claim 11 wherein the pre-determined impedance is approximately 320Ω.

13. (UPON ENTRY OF AMENDMENT AFTER FINAL) A method of controlling a DC feed from a subscriber loop interface circuit (SLIC), comprising the steps of:

switching from a normal mode DC feed following a first characteristic curve to a modified mode DC feed following a second characteristic curve when $I_L \geq I_{THL}$, wherein I_L is a subscriber loop current; and

switching from the modified mode to the normal mode when $I_L \leq I_{THH}$, ~~wherein I_{THH} and I_{THL} are distinct~~ wherein $\underline{I_{THH} \geq I_{THL}}$, wherein switching between modes occurs with hysteresis such that for each characteristic curve the switched-to DC feed point is substantially distinct from the switched-from DC feed point on the same characteristic curve.

14. (PREVIOUSLY PRESENTED) The method of claim 13 wherein the first characteristic curve is linear, wherein the first characteristic curve is defined by an open circuit voltage, V_{OC}, and a slope corresponding to a pre-determined impedance.

15. (PREVIOUSLY PRESENTED) The method of claim 14 wherein the pre-determined impedance is approximately 320Ω.

16. (PREVIOUSLY PRESENTED) The method of claim 13 wherein the first characteristic curve is linear, wherein the second characteristic curve is defined by a target open circuit voltage, V_{OC_TARGET}, and a slope corresponding to a pre-determined impedance.

EVIDENCE APPENDIX

This Section Not Applicable

RELATED PROCEEDINGS APPENDIX

This Section Not Applicable